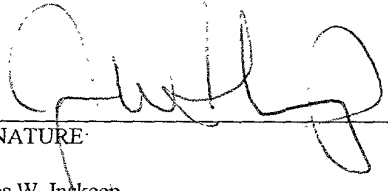


FORM PTO-1390 (REV. 1-98)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 20762-12
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/980235
INTERNATIONAL APPLICATION NO. PCT/ZA00/00027	INTERNATIONAL FILING DATE 21 February 2000	PRIORITY DATE CLAIMED 31 May 1999	
TITLE OF INVENTION Screens			
APPLICANT(S) FOR DO/EO/US David Llewellyn OWEN			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</p> <p>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input checked="" type="checkbox"/> have been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input type="checkbox"/> have not been made and will not be made</p> <p>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11. to 16. below concern document(s) or information included:</p> <p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31. An assignment of the invention to: _____</p> <p>13. <input checked="" type="checkbox"/> A FIRST preliminary amendment.</p> <p><input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>14. <input type="checkbox"/> A substitute specification.</p> <p>15. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>16. <input type="checkbox"/> Other items of information:</p>			

U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 097980235		INTERNATIONAL APPLICATION NO PCT/ZA00/00027		ATTORNEY'S DOCKET NUMBER 20762-12	
17. <input type="checkbox"/> The following fees are submitted:				CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO..... \$890.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) \$710.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) \$740.00 Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$1040.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provision of PCT Article 33(2)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				\$1040.00	
Surcharge of \$130 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).					
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	11 - 20 =	0	x \$18.00		
Independent claims	1 - 3 =	0	x \$80.00		
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00		
TOTAL OF ABOVE CALCULATIONS =				\$1040.00	
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.0, 1.27, 1.28).				\$520.00	
SUBTOTAL =				\$520.00	
Processing fee of \$130 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				+	
TOTAL NATIONAL FEE =				\$520.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40 per property				+	
TOTAL FEES ENCLOSED =					
				Amount to be:	
				refunded \$	
				charged \$	
<p>a. <input type="checkbox"/> A check in the amount of \$_____ to cover the above fees is enclosed.</p> <p>b. <input checked="" type="checkbox"/> Please charge my Deposit Account No. <u>16-2230</u> in the amount of \$ <u>\$520.00</u> to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayments to Deposit Account No. <u>16-2230</u>. A duplicate copy of this sheet is enclosed.</p> <p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p> <p>SEND ALL CORRESPONDENCE TO: Customer Number. <u>25204</u></p> <p>Oppenheimer Wolff & Donnelly, LLP 840 Newport Center Drive, Suite 700 Newport Beach, CA 92660 Tel: 949-823-6000 Fax: 949-823-6100</p>					
				 SIGNATURE James W. Inskeep NAME <u>33,910</u> REGISTRATION NUMBER	

09/980235
JC19 Rec'd PCT/PTO 28 NOV 2001
PATENT

CERTIFICATE OF MAILING	
I hereby certify that on <u>11/28/01</u> , this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service with sufficient postage in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, DC 20231.	
37 C.F.R. § 1.8(a) <input type="checkbox"/> with sufficient postage to as first class mail	37 C.F.R. § 1.10 <input checked="" type="checkbox"/> as "Express Mail Post Office" Addressee" Mailing Label No. <u>EL793862659US</u>
<u>Angela Wendel</u> Angela Wendel	

Applicant: **David Llewellen Owen**
Serial No.:
Filed:
Title: **SCREENS**
Examiner:
Group Art Unit:
Atty Docket No.: **20762-12**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PRELIMINARY AMENDMENT

U.S. Patent and Trademark Office
P.O. Box 2327
Attn: DO/EO/US
Arlington, VA 22202

Sir:

Preliminary to examination, please amend the above-identified application as outlined below.

In The Claims

Please delete claims 1-29, without prejudice.

Please add new claims 30-40 as follows:

--30. (New) A fastening means for screening panels, which fastening means includes: fasteners, each fastener as a combination structure having a metal bolt as a tensile component and a polymeric holding component which has a ledge for holding down a panel; and a stringer for use as a joist in a screen frame, the stringer comprising a strip of cross section having a narrow width and depth sufficient to carry vertical reciprocating loads, presenting neither a top nor a bottom web, but a plurality of spaced apart platforms, each platform presenting a fastening formation which receives the tensile component, for securing a panel and a support area around or adjacent the fastening formation for supporting the panel, characterized in that there are a plurality of spaced apart separate fasteners and in that each platform is in the form of a disc having a hole in its center and the hole is immediately above the centroid of the stringer.

31. (New) A fastening means as claimed in claim 1, which further includes a cover for an exposed portion of the metal tensile component.

32. (New) A fastening means as claimed in claim 2, in which the cover has a skirt providing an improved barrier to ingress of material.

33. (New) A fastening means as claimed in claim 1, in which the fastener is provided in combination with a toggle or butterfly near an end of the metal tensile component, for engaging a blind hole in a screening frame.

34. (New) A fastening means as claimed in claim 4, in which the toggle comprises a strip or plate with the tensile member passing through an offset hole, the plate narrow enough to be passed through a hole in the screening frame member when misaligned, but long enough to be held when aligned.

35. (New) A fastening means as claimed in claim 4, in which the polymeric holding component is provided with a further step which fits into an enlarged hole provided in the screen frame.

36. (New) A fastening means as claimed in claim 1, provided together with a screening panel which is provided with co-acting formations for co-acting with the fastener, in which that part of the formation of the panel for co-acting with the ledge of the fastener is located at an intermediate position in the depth of the panel, in which the co-acting formations in the panel are provided at the edges of the panel and in which the co-acting formations include also a portion for co-acting with the skirt, which formations allow the skirt to enter partially into the depth of the panel.

37. (New) A fastener for screening panels fastening means, as claimed in claim 1, which fastener comprises a combination structure including a metal tensile component in the form of a bolt and nut and a concentric polymeric holding component

which includes a ledge for holding a panel, and a cover for an exposed portion of the metal tensile component.

38. (New) A fastener for screening panels, as claimed in claim 8, in which the cover has a skirt which fits into a co-acting recess in the edges of the panels providing an improved barrier to ingress of material.

39. (New) A fastener for screening panels, as claimed in claim 8, in which the fastener is provided in combination with a toggle near an end of the metal tensile component, for engaging a blind hole in a screening frame, in which the toggle comprises a strip or plate with the tensile member passing through an offset hole, the plate narrow enough to be passed through a hole in the screening frame member when misaligned, but long enough to be held when aligned.

40. (New) A stringer for screening means, which includes a fastening means as claimed in claim 7, the stringer for use as a joist in a screen frame, the stringer comprising a strip of cross section having a narrow width and depth sufficient to carry vertical reciprocating loads, presenting neither a top nor a bottom web, but a plurality of spaced apart platforms, each platform presenting a fastening formation which receives a fastener for screening panels, for securing a panel and a support area around or adjacent the fastening formation for supporting the panel which comprises a disc having a hole in its center, the hole providing a fastening formation and the surround of the disc a support area for the panel around the hole in which the center of the hole is immediately above the centroid of the section of the stringer.

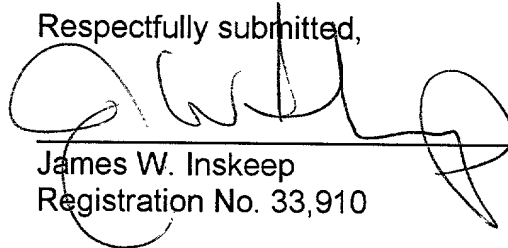
Remarks

By way of this Preliminary Amendment, original claims 1-29 are cancelled and new claims 30-40 are added. Applicant respectfully requests examination of these new claims.

The Commissioner is authorized to charge any fee which may be required in connection with this Amendment to deposit account No. 16-2230.

Dated: November 28, 2001

Respectfully submitted,



James W. Inskeep
Registration No. 33,910

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SCREENS**FIELD OF THE INVENTION**

This invention lies in the field of screening particulate material, non-limiting examples are screens which are used extensively in grading of ores and other materials in mining and process operations. In addition to woven wire screens and perforated sheet and plate screens, screens made up of a plurality of screening panels have attained wide application. Such screening panels, for example, are manufactured by casting a suitable grade of polyurethane and the panels are mounted contiguously in a tiling fashion on a screening frame.

THE PRIOR ART

The fastening of such screening panels onto a frame has received attention in engineering design and been an important factor in the successful application of moulded polyurethane screen panels. Many designs have been developed, merely as examples may be mentioned fastenings shown in South African patent 73/5815 granted to Screenex Wire Weaving Manufacturers (Pty) Ltd and South African patent 80/4039 granted to Steinhaus GmbH. Many variations of such designs have been developed over the intervening years, a feature of the fastenings used up to now being that they are made of the same polymeric material as the screen panels which they hold.

Vibratory frequencies and amplitudes specified in current practice have been selected so that acceleration of the panels at the fastenings does not exceed a generally accepted limit. This limit is about 4.5G (four point five times the acceleration due to gravity). Beyond this limit experience has shown that the fastenings become unreliable and/or tend to fail prematurely while in service.

Modern practice requires accelerations in excess of the limit mentioned.

Another system used, the so-called clipper system, does have better holding capacity at high accelerations, but is not always appropriate, depending on various

considerations applicable to a particular installation, customer's requirements, and the like. Other systems available are subject to wear resulting from a tendency of material being screened seeping into crevices between the fixing parts and the frame causing the frame fixing locations to wear out. The wear reaches a stage where the fastening pin system fails. For example, the hole in the frame in which the fastening is secured becomes oversize due to wear, until the fastening fails. The material being screened in many cases becomes an unfortunately very effective grinding medium acting on the frame.

Thus the screening frame is also an important component in the fastening and acceleration problems which must be addressed in current practice. In current practice the screening frame may either be a frame made up for fixing to a screening machine or it may be a frame existing as part of the screening machine. Such screens generally are a structural fabrication of elongate structural members, usually extending in longitudinal and transverse directions. They form a grid upon the members of which screen panels can be mounted and secured. Structural members commonly used include girders, joists and other beams which may be of I section, angle section, channel section or square tube section, for example. The girders are in general of larger section and are spanned by joists of smaller section. All the sections used provide a web which has a depth sufficient to carry the vertical reciprocating loads and a flange which presents a horizontal surface to support the panels which are carried by the screen frame and to fix them to the frame.

THE INVENTION

In accordance with the present invention, there is provided a fastener for a screening panel, which fastener comprises a combination structure including a metal tensile component and a polymeric holding component which includes a ledge for fastening a panel.

The ledge may be in the form of a shoulder, bush, ridge, land or like structure, which is adapted to fasten a panel down, generally against a screen frame. The screen

frame may be a part of a screening machine, or may be made up for a particular application, to be fastened to a screening machine. The ledge must be of sufficient bearing area on the panel, to effectively fasten the panel, during use. If the area is too small, the shearing stresses in the panel material rise to levels at which localised heating develops and the molecular structure of the polymer tends to degrade, leading to failure after a period. With sufficient area, in accordance with this invention, the holding component adequately holds the panel down for more than the service life of the panel.

Although the fastener according to this invention could be used with a conventional frame, the present invention also provides a stringer for preferred use as a joist in a screen frame, the stringer comprising a strip of cross section having a narrow width and depth sufficient to carry vertical reciprocating loads, presenting neither a top nor a bottom web, but a plurality of spaced apart platforms, each platform presenting a fastening formation for a panel and support area around or adjacent the fastening formation, for a panel.

For example, each platform can comprise a disc having a hole in its centre, the hole providing a fastening formation and the surround of the disc a support area for the panel around the hole.

It is desirable that the platform is positioned above or coinciding with the centroid of the stringer section, so as to avoid exerting any eccentric loads on the stringer. If a fastening formation in the form of a hole is then located immediately above the centroid of the stringer, then immediately underneath the hole a recess can be provided in the stringer to accommodate a fastener which co-acts with the hole to fasten the panel, for example, a bolt head of a bolt.

Preferably the upper support surfaces of the platforms is flush with the upper surface of the stringer, so that these surfaces all provide support for panels mounted on the stringer.

Preferably the fastener and the stringer of this invention are used together in order to obtain the maximum advantages of the invention..

In accordance with a preferred embodiment of the invention, screening panels are provided with co-acting formations for co-acting with the fasteners, including in particular, the ledges of the fasteners. Preferably that part of the formation for co-acting with the ledge of each fastener is located at an intermediate position in the depth of the panel.

The provision of fasteners in accordance with this invention together with panels having co-acting formations thus also falls within the scope of this invention.

In a preferred application of the invention, those screening panels which are mounted contiguous with adjacent panels are provided with these formations at their edges; this allows the fasteners to each simultaneously fasten two contiguous panels of this kind.

The metal tensile component conveniently in most applications comprises a bolt and nut. A lock washer or locking nut is advisable. The polymeric holding component is preferably a stepped bush through the hole of which the bolt is passed, the step of the bush providing the required ledge for fastening the panel.

In a preferred embodiment, the fastener structure further includes a cover for an exposed portion of the metal tensile component. Where an upper end of the tensile component would otherwise be exposed, it is preferably covered by the cover. The reason is to avoid, as far as possible, exposure of this end to abrasive material being screened and the ingress of material into interstices between the metal tensile component and the polymeric holding component and between the fastener combination structure and the panel and/or the screening frame to which the panel is fastened. For example, the nut and threaded end of the bolt may be uppermost, this is best covered with the cover.

Preferably, the cover is provided with a skirt adapted to be fitted onto the tensile member with the skirt providing an improved barrier to ingress of material being screened into the interstices mentioned above.

Where a panel which has co-acting formations for the fastener is provided, preferably the formations include also a portion for co-acting with the skirt. Preferably these formations allow the skirt to enter partially into the depth of the panel.

In accordance with a preferred embodiment of the invention, the fastener is provided in combination with a toggle or butterfly near an end of the metal tensile component, for engaging a blind hole in a screening frame. A blind hole may arise where the frame uses, for example, square tube members, or other structural members where the tensile member must be connected without access to both sides of the member. The toggle may comprise a strip or plate with the tensile member passing through an offset hole, the plate narrow enough to be passed through a hole in the screening frame member when misaligned, but long enough to be held when aligned. The hole in the screening panel must be of larger diameter than would be necessary for the shaft of the tensile member, e.g. a bolt, to pass through in normal manner. This enlarged hole is large enough to allow the tensile member and toggle to pass through, suitable angled to minimise their effective size. Preferably the polymeric holding component is provided with a further step which fits into the enlarged hole provided in the screen frame, thus locating the tensile member and toggle in a holding position with enhanced security.

THE DRAWINGS

The invention will be more fully described by way of a non-limiting examples which are illustrated in the drawings in which : -

figure 1 is a cross sectional elevation of a fastener in accordance with a preferred embodiment of the invention, holding adjacent panels on a conventional frame;

figure 2 is a view of a tensile member and toggle;

figure 3 is an elevation of the fastener shown in figure 1, holding adjacent panels on a disc top stringer according to a preferred embodiment of the invention;

figure 4 is an elevation of the polymeric holding component of the fastener shown in figures 1 and 3;

figure 5 is an elevation of the cover of the fastener shown in figures 1 and 3;

figure 6 is a plan view on a panel having co-acting formations for the fastener shown in figures 1 and 3;

figure 7 is a cross sectional elevation, on section VII-VII shown in figure 7, of the co-acting formations;

figure 8 is an elevation of an alternative polymeric holding component to that shown in figures 1 and 3;

figure 9 is a side elevation of a disc top stringer in accordance with a preferred embodiment of the invention;

figure 10 is an enlarged plan view of a portion of the stringer;

figure 11 is an enlarged elevation of the portion of the stringer; and

figure 12 is an isometric view of the portion of the stringer.

THE PREFERRED EMBODIMENTS

As shown in figure 1, the fastener 1 comprises a combination structure of a metal (steel) tensile component, in the form of a bolt 2 and nut 3, and a polymeric (polyurethane) holding component 4. The holding component 4 has a ledge 5 or shoulder for holding contiguous panels 6 and 7 and a hole 26 for the bolt.. The ledge is formed by a step down in diameter of the bush-like shape of the holding component. The fastener fastens the panels 6 and 7 to a screen frame 8. The upper end of the bolt and the nut are covered by a cover 9, also of polyurethane. The cover has a skirt 10 which fits into a co-acting recess formation 11 (see figure 7) in the edges of the panels. The bore 12 of the cover is a tight or force fit onto the thread of the bolt, the cover can be knocked on with a hammer. An enlarged part 26 of the bore accomodates the nut 3. A lock washer 13 is used under the nut. A toggle 14 is provided under the bolt head 15 with the bolt passing through an off centre hole 16 in the toggle. The bolt head and toggle are passed through a hole 16 in the screen frame; this is accomplished from above the frame, it not being necessary to reach under the frame.

Referring to figure 2, it will be seen that this is made possible by the toggle being narrow enough to be passed through the hole 16 when the toggle is misaligned in the position indicated in figure 2; from this position, the toggle and bolt head are passed entirely through the hole, as indicated by the arrow 17, rotated to an aligned position in which the length of the toggle is sufficient to hold as shown in figure 1. For this purpose, the hole 16 is larger than would normally be required for the bolt and once in the position, the second step 18 of the holding component fits neatly into the enlarged hole, so as to make the holding by the toggle more secure.

Figure 3 shows the best of all combination according to the preferred embodiment of the invention. Two adjacent panels 6 and 7 are held by a composite fastener 1 as described with reference to figures 1 and 2 to 8 onto a disc top stringer 31 as

described with reference to figures 9 to 11. The same reference numerals are used and the descriptions are referred to.

Figure 4 shows the holding component 4, the description with reference to figure 1 is referred to and the same reference numerals are used. The hole 25 for passage of the bolt in use is shown in broken lines.

Figure 5 shows the cover 9, the same reference numerals are used as in figure 1 and the description is referred to.

Figures 6 and 7 are exemplary of a simple panel having formations for the fastener shown in figures 1 to 5. The panel can have quarter circle formations at its corners and half circle formations 20 at its edges. Each formation includes the indentation 12 for the cover skirt and indentation 21 for the ledge of the holding component. The area of the surface 22, corresponding to the area of the ledge 5 formed by the step of the holding component is important. It must be sufficient to take the forces generated by high accelerations of the screen frame without generating too high stresses in the material of the panel and the holding component.

Figure 8 shows an alternative holding component. It has a ledge 41 for holding down a panel, a surface 42 to rest on the frame or stringer disc, a formation 43 to engage with a co-acting formation of the panel, a bore 44 for the nut and a bore 45 for the bolt shaft.

As shown in figures 9 to 11 of the drawings, the stringer 31 comprises a flat strip 32 which has a narrow width 33 and a large depth 34. The strip is thus an inexpensive section.

The strip has a plurality of spaced apart platforms 35 along its length, in this example, of disc shape. Each disc has a hole 36 in it, for fastening a panel to the stringer by means of a bolt or other fastener (not shown). The centre of the hole is

positioned coinciding with the centroid (indicated by broken line 37) of the stringer. This results in no eccentric loads being imposed on the stringer.

The upper surfaces of the platforms are flush with the upper surface of the stringer, this provides a continuous surface for support of panels.

To provide space for a bolt or other fastener to pass through the hole 36, a recess 38 is provided in the stringer.

The platform may be welded or otherwise fixed to the stringer in a suitable way.

The stringers may be provided as modules of a selected length, for example, as shown in figure 9, to suit conveniently screen frames in which they will be used. The platforms can also be provided at standard spacings to suit the dimensions of panels which are to be mounted on and fixed to the stringers.

In principle the platforms can of course have other shapes than circular discs, and can be adapted to the panels to be supported and fixed.

THE CLAIMS

- 1) A fastening means for screening panels, which fastening means includes: a fastener as a combination structure having a metal tensile component and a polymeric holding component which has a ledge for holding down a panel; and a stringer for use as a joist in a screen frame, the stringer comprising a strip of cross section having a narrow width and depth sufficient to carry vertical reciprocating loads, presenting neither a top nor a bottom web, but a plurality of spaced apart platforms, each platform presenting a fastening formation which receives the tensile component, for securing a panel and a support area around or adjacent the fastening formation for supporting the panel.
- 2) A fastening means as claimed in claim 1, in which the metal tensile component comprises a bolt and nut.
- 3) A fastening means as claimed in either one of claims 1 or 2, which further includes a cover for an exposed portion of the metal tensile component.
- 4) A fastening means as claimed in claim 3, in which the cover has a skirt providing an improved barrier to ingress of material.
- 5) A fastening means as claimed in any one of claims 1 to 4, in which the fastener is provided in combination with a toggle or butterfly near an end of the metal tensile component, for engaging a blind hole in a screening frame.
- 6) A fastening means as claimed in claim 5, in which the toggle comprises a strip or plate with the tensile member passing through an offset hole, the plate narrow enough to be passed through a hole in the screening frame member when misaligned, but long enough to be held when aligned.

- 2000-09-09
- 7) A fastening means as claimed in either one of claims 5 or 6, in which the polymeric holding component is provided with a further step which fits into an enlarged hole provided in the screen frame.
 - 8) A fastening means for screening panels, which includes a fastener as herein generally described.
 - 9) A fastening means for screening panels, which includes a fastener as herein specifically described with reference to figures 1 to 7 of the drawings and as illustrated.
 - 10) A fastening means as claimed in any one of claims 1 to 9, in which each platform of the stringer has a disc having a hole in its centre, the hole providing a fastening formation and the surround of the disc a support area for the panel around the hole.
 - 11) A fastening means as claimed in claim 10, in which the centre of the hole is located immediately above the centroid of the stringer section and a recess is provided in the stringer immediately underneath the hole.
 - 12) A fastening means as claimed in either one of claims 10 or 11, in which the upper support surface of the platform is flush with the upper surface of the stringer.
 - 13) A fastening means for screening panels, which includes a stringer as herein generally described.
 - 14) A fastening means for screening panels, which includes a stringer as herein specifically described with reference to figures 9 to 11 of the drawings.

AMENDED CLAIMS

[received by the International Bureau on 29 September 2000 (29.09.00);
original claims 21-36 replaced by new claims 21-34; remaining claims unchanged (3 pages)]

- 15) A fastening means as claimed in any one of claims 1 to 14, provided together with a screening panel which is provided with co-acting formations for co-acting with the fastener.
- 16) A fastening means and screening panel as claimed in claim 15, in which that part of the formation of the panel for co-acting with the ledge of the fastener is located at an intermediate position in the depth of the panel.
- 17) A fastening means and screening panel as claimed in either one of claims 15 or 16, in which the co-acting formations in the panel are provided at the edges of the panel.
- 18) A fastening means and screening panel as claimed in any one of claims 15 to 17, in which the co-acting formations include also a portion for co-acting with the skirt, which formations allow the skirt to enter partially into the depth of the panel.
- 19) A fastening means and screening panel as herein generally described.
- 20) A fastening means and screening panel as herein specifically described with reference to the drawings and as illustrated.
- 21) A fastener for screening panels, which fastener comprises a combination structure including a metal tensile component in the form of a bolt and nut and a polymeric holding component which includes a ledge for holding a panel, characterized in that it further includes a cover for an exposed portion of the metal tensile component.
- 22) A fastener for screening panels, as claimed in claim 21, in which the cover has a skirt which fits into a coacting recess in the edges of the panels providing an improved barrier to ingress of material.

- 23) A fastener for screening panels, as claimed in either one of claims 21 or 22, in which the fastener is provided in combination with a toggle or butterfly near an end of the metal tensile component, for engaging a blind hole in a screening frame.
- 24) A fastener for screening panels, as claimed in claim 23, in which the toggle comprises a strip or plate with the tensile member passing through an offset hole, the plate narrow enough to be passed through a hole in the screening frame member when misaligned, but long enough to be held when aligned.
- 25) A fastener for screening panels, as claimed in either one of claims 23 or 24, in which the polymeric holding component is provided with a further step which fits into an enlarged hole provided in the screen frame.
- 26) A fastener for screening panels, as herein generally described.
- 27) A fastener for screening panels, as herein specifically described with reference to figures 1 to 8 of the drawings and as illustrated.
- 28) A stringer for screening means, for use as a joist in a screen frame, the stringer comprising a strip of cross section having a narrow width and depth sufficient to carry vertical reciprocating loads, presenting neither a top nor a bottom web, but a plurality of spaced apart platforms, each platform presenting a fastening formation which receives a fastener for screening panels, for securing a panel and a support area around or adjacent the fastening formation for supporting the panel.
- 29) A stringer as claimed in claim 28, which comprises a disc having a hole in its centre, the hole providing a fastening formation and the surround of the disc a support area for the panel around the hole.

- 30) A stringer as claimed in claim 29, in which the centre of the hole is immediately above the centroid of the section of the stringer.
- 31) A stringer as claimed in either one of claims 29 or 30, in which the stringer is provided with a recess immediately below the platform.
- 32) A stringer as claimed in any one of claims 28 to 31, in which the upper support surface of the platform is flush with the upper surfaces of the stringer.
- 33) A stringer as herein generally described.
- 34) A stringer as herein specifically described with reference to figures 9 to 11 of the drawings and as illustrated.

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 December 2000 (07.12.2000)

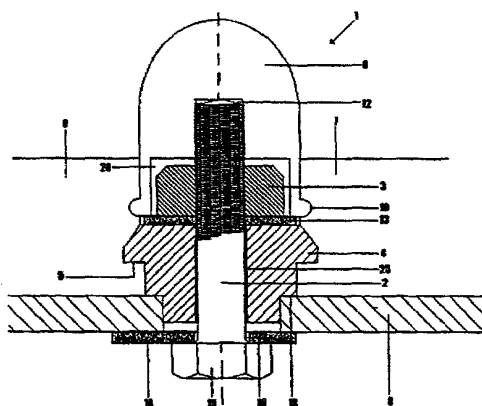
PCT

(10) International Publication Number
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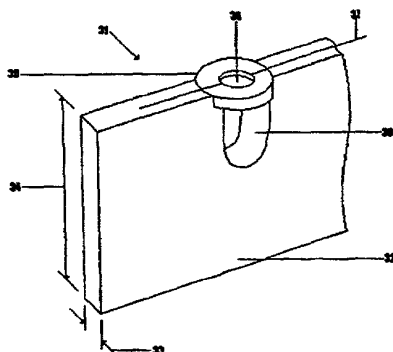
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- (71) Applicant and
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[Continued on next page]

(54) Title: SCREENS



(57) Abstract: A fastening means (1) for fastening polyurethane screening panels (6, 7) to a screen (8) comprises a composite fastener and a disc and stringer support. The composite fastener is a steel bolt (2) and nut (3) with a polyurethane holding component (4) and a polyurethane cover (9) for the bolt head. The disc and stringer support is a stringer (31) serving as a joist spanning between girders of the screen frame, the stringer (31) having no flange and being narrow and deep, with discs (35) set in the top surface of the stringer at spaced apart positions, having a hole (36) in each disc for the bolt and nut and a recess (38) in the stringer underneath each disc for the nut. The bolt and nut have a toggle (14) which allows insertion into the hole in the disc and tightening the bolt and nut entirely from above the screen.



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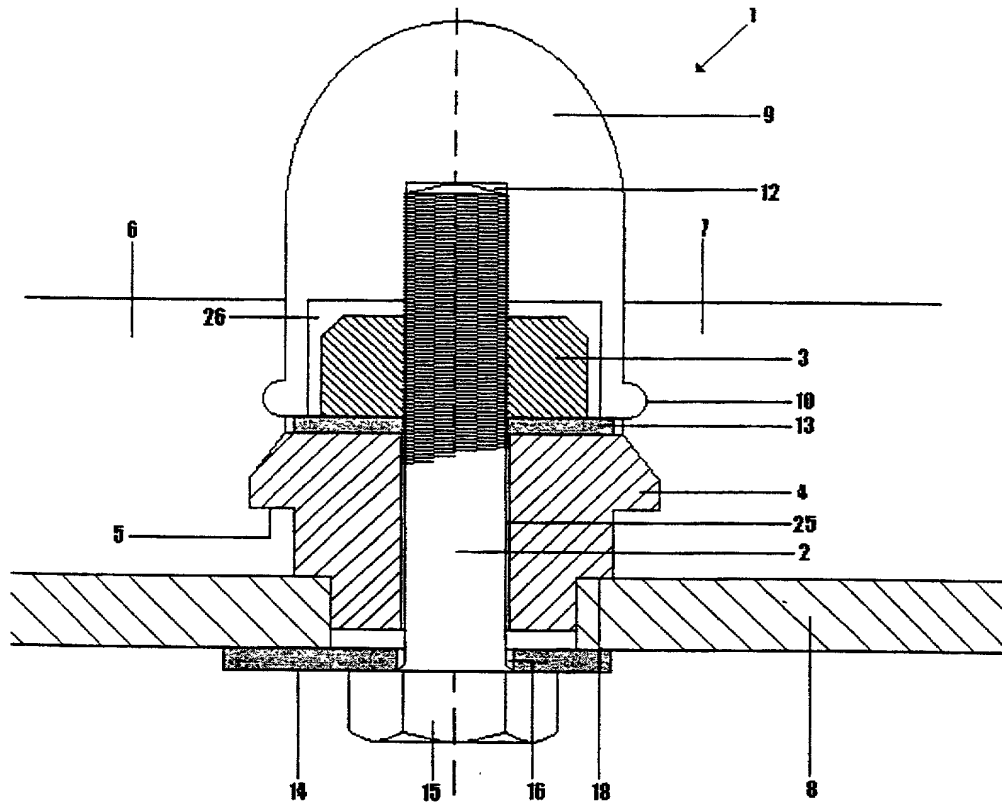


Figure 1

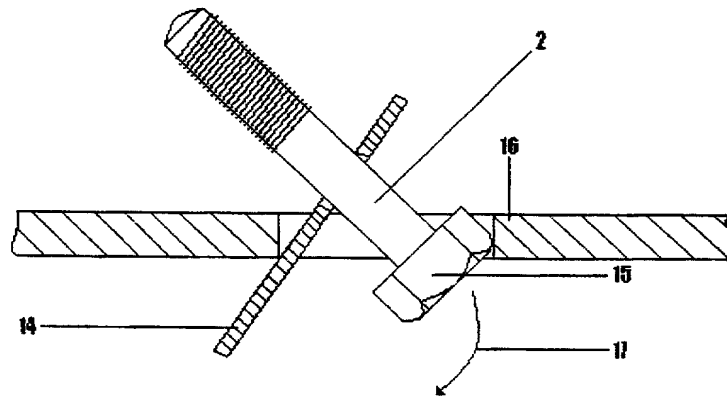


Figure 2



Figure 3

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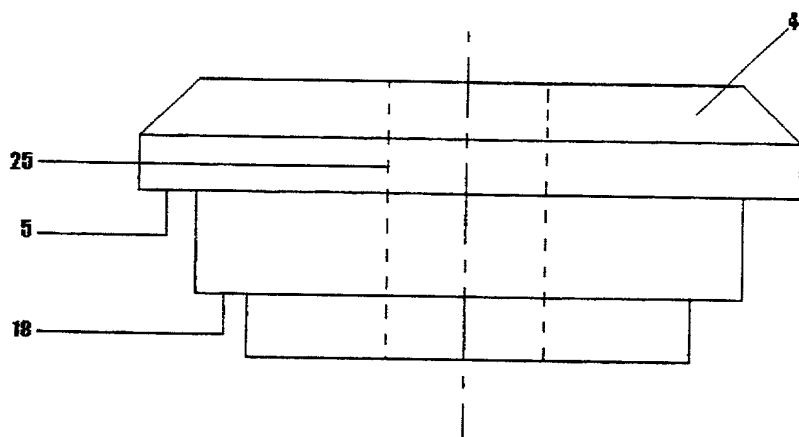


Figure 4

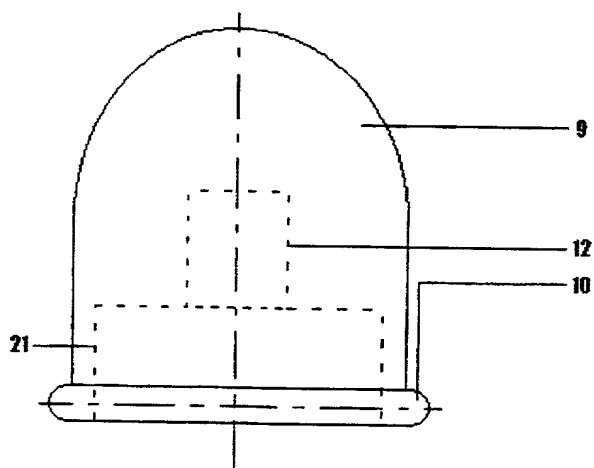


Figure 5

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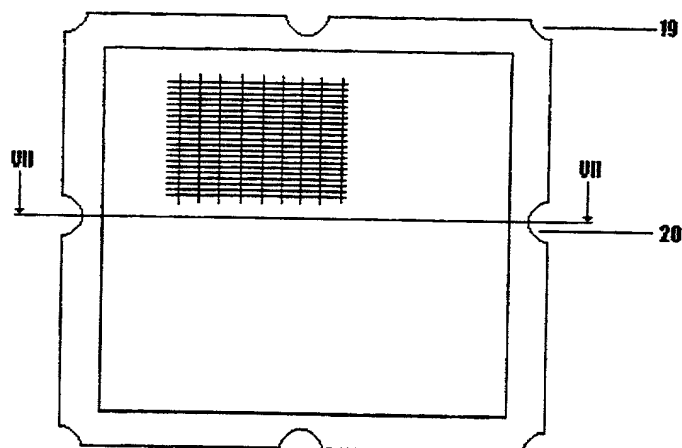


Figure 6

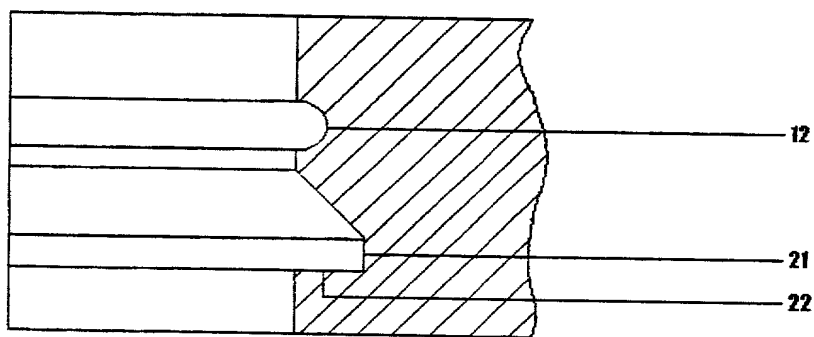


Figure 7

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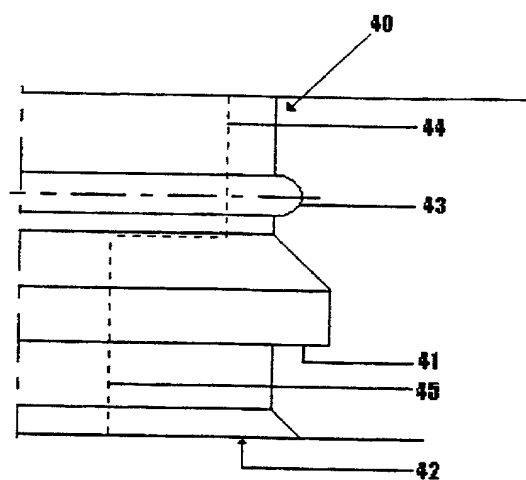


Figure 8

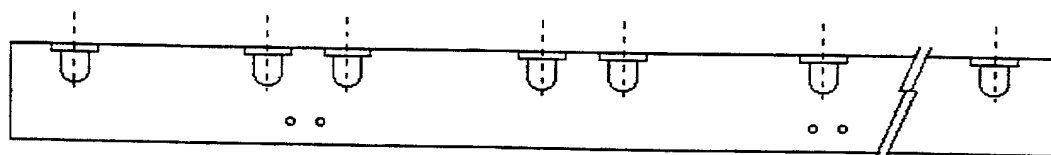


Figure 9

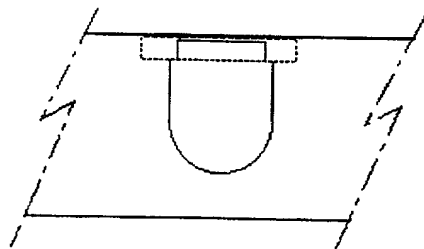
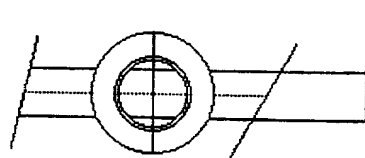


Figure 10

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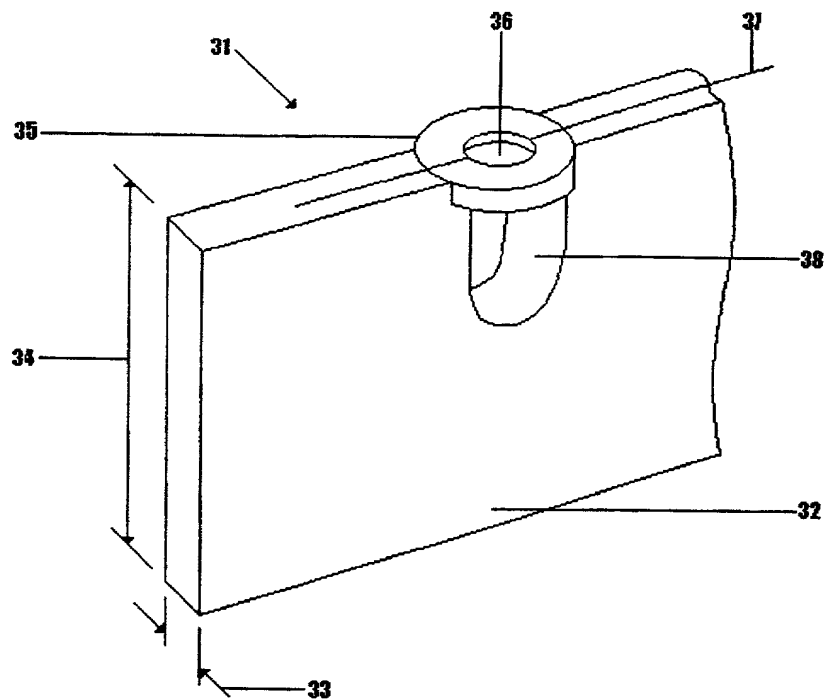


Figure 11



PATENT
Docket No 20762-12

COMBINED DECLARATION, POWER OF ATTORNEY AND PETITION

As a below named inventor, I hereby declare that:

This declaration is of the following type:

original divisional
design continuation
supplemental continuation-in-part
national stage of PCI

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled Screening the specification of which:

- (a) is attached hereto
(b) was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable).
(c) was described and claimed in PCT International Application No. PCT/ZA00/00027, filed on 21 February 2000 and as amended under PCT Article 19 on 29 September 2000 (if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 USC 119(a)-(d), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by check the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s) or any PCT international application having a filing date before that of the application of which priority is claimed.

- (d) no such applications have been filed
(e) such applications have been filed as follows:

Prior Foreign Application Number(s)	Country (or indicate if PCT)	Date of Filing (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached
PCT/ZA/00/00027	PCT	02/21/2000		Yes No
99/04179	ZA	07/22/1999		Yes No
99/03660	ZA	05/31/1999		Yes No

- 1 -

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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